

西藏特有竹子 *Arundinaria macclureana* 的名实辨正*

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摘要: *Arundinaria macclureana* 是在现代植物学中根据在西藏采集的标本描述的第一个竹子。其模式标本是1938年采集的, 但只有花枝, 没有地下茎、秆箨等重要特征。尽管如此, 该种还成为了新属 *Borinda* 的模式种。在研究了其模式标本后, 使本文第一作者联想起1991年在藏东南采集的西藏箭竹 (*Fargesia setosa*)。西藏箭竹的模式标本采集于1977年, 但只有营养体, 没有花枝。在对比研究两个名称的模式后, 确认二者实为同种。经与共同作者一起讨论, 认为其正确学名为 *Fargesia macclureana*, 但该种所在的筱竹属群的关系还有待进一步的研究。

关键词: 西藏箭竹; *Arundinaria macclureana*; 名实辨正; 西藏

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The Identity of an Endemic Tibetan Bamboo, *Arundinaria macclureana* (Gramineae, Bambusoideae)

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Abstract: *Arundinaria macclureana* Bor was the first bamboo described in modern taxonomy based on Tibetan material. Since the type bears only flowering branches without critical vegetative characteristics such as rhizomes and culm-sheaths, its identity has long been doubtful. Even so, it provides the type of a newly created genus, *Borinda*. By checking the type specimens of *A. macclureana* as well as the type of *Fargesia setosa* T. P. Yi, which is a species only known by its vegetative state, and by collecting in the field, a conclusion is reached that these two entities are conspecific. *Fargesia macclureana*, a name published in less received literature is the correct name for this endemic Tibetan bamboo, although re-evaluation of the relationships within the *Thamnocalamus* group is needed.

Key words: *Fargesia setosa*; *Arundinaria macclureana*; Identity; Tibet

Introduction

Our knowledge about bamboos in Tibet (Xizang) has been very imperfect because of the difficulties in collecting this taxonomically troublesome group. *Arundinaria macclureana* Bor (1958) was the first Tibetan bamboo described in modern taxonomy based on

material collected by Ludlow, Sherriff and Taylor in 1938. However, because no further material was traced and the type material bears only flowering branches without critical vegetative parts such as rhizomes and culm-sheaths, the identity of this species has been a puzzle since it was published.

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After the time of Ludlow *et al.*, the bamboos in Tibet had not been explored until 1977 when Yi Tong-Pei made his first expedition to SE Tibet. Yi collected some twenty-four species of bamboos during his 1977 and 1979 expeditions, among which, eighteen were described as new (Yi, 1983a). Recent study showed that one out of the new species, *Chimonocalamus tortuosus* Hsueh & T. P. Yi was a synonym of *C. griffithianus* (Munro) Hsueh & T. P. Yi, typified by *Griffith* s.n. collected in Khasi Hills, NE India (Li, 1994). The majority of Yi's new species was described under *Fargesia* and *Yushania* (Yi, 1983b), with several transferred from *Arundinaria*. However, he did not mention *A. macdureana* in his two publications nor in his contributions to the Flora Xizangica (in Wu, 1987). Until very recently, Keng & Song (1994) still doubted that *A. macdureana* might be a species of *Fargesia* or *Yushania*. The Flora Reipublicae Popularis Sinicae volume for bamboos does not mention it either (Keng & Wang, 1996). Obviously, it is a little-known species, particularly to the Chinese botanists.

Meanwhile, American and European botanists were also making efforts to clarify bamboo taxonomy in the Himalayas. Campbell (1991) was the first to cite *Arundinaria macdureana* 33 years after its publication. Stapleton (1993) transferred *A. macdureana* into *Fargesia*, thinking it might be traced in some European gardens. In his enumeration of Himalayan bamboos, Stapleton (1994) further transferred this species into his newly created genus *Borinda* and designated it as type of the genus. Eight species of *Borinda* were recognized in Nepal, Bhutan and Tibet, while the closest species of *B. macdureana* was Yi's *Fargesia setosa* (as *B. setosa*). Again, no further material was mentioned under *B. macdureana*, confirming its doubtful status, but both were recognized.

Taxonomy and nomenclature

The type specimen of *Arundinaria macdureana*, Ludlow, Sherriff & Taylor 7297 at BM, is composed of a flowering branch and a leafy one. One of the paratypes, Ludlow, Sherriff & Taylor 4395, also has

spikelets, while a second sheet has a culm internode with a branching pattern. The type specimen of *Fargesia setosa* is composed of only vegetative parts, including a leafy branch, two culm sheaths and two internodes. It would be very difficult to compare these two entities without detailed examination of type specimens of both names. A close look at them side by side shows that both collections bear leaves characterized by dense white hairs on the undersides of the blades and petioles, and internodes covered by wax. This correlation does not occur in any other allied Tibetan bamboos. By examining more specimens of Ludlow *et al.* (all cited by Bor, 1958) at the Natural History Museum (London), the Royal Botanic Garden Edinburgh and the Smithsonian Institution, it was noticed that other characters, including the very hairy leaf sheath, short leaf ligules, very small (sometimes absent) auricles and oral setae, number of secondary veins and visible transverse veins, all confirm this correlation. Another specimen collected by the first author and colleagues, Fei, Sun Li & Bai 323, which was collected in the same area, with vegetative parts identical with *F. setosa*, shares the same branching pattern with Ludlow, Sherriff & Taylor 4395. Yi's other collections cited under *F. setosa* share these features. A detailed study of the field notes reached the same conclusion: the type localities of both were dominated by *Picea* or *Pinus densata* forests, and the only bamboo found was a species with vegetative parts identical to what was described in *F. setosa*. A conclusion is therefore reached that *A. macdureana* and *F. setosa* are conspecific. This has been already suggested by Campbell (1991), but without specimen citation and justification.

The generic placement of this species has been very uncertain and it has been placed in four genera so far: *Arundinaria*, *Borinda*, *Fargesia* and *Sinarundinaria*. The picture is now clear, and at this point it is possible to find a proper place for the species. As re-defined by McClure (1973) and followed by most authors (e.g. Soderstrom & Ellis, 1982; Chao & Renvoize, 1989; Stapleton, 1994),

Arundinaria is a genus with leptomorph rhizomes (running underground stems) and *A. macclureana* therefore can not be placed in *Arundinaria* because of its pachymorph rhizomes. It belongs to the alpine bamboos (Guo *et al.*, 2001) or the *Thamnocalamus* group (Guo *et al.*, 2002) involving *Borinda*, *Fargesia*, *Thamnocalamus* and *Yushania*. *Fargesia*, as typified by *F. spathacea*, may be not the most appropriate genus: it produces a condensed spathaceous inflorescence and is sometimes treated as synonym of *Thamnocalamus* (Soderstrom, 1979; Clayton & Renvoize, 1986; Chao & Renvoize, 1989). As seen on the herbarium sheets, Bor first determined *A. macclureana* as *Sinarundinaria macclureana* in 1953 and the latter combination was validated by Yang & Chao (1994), though neither specimens were cited nor reasons given. Li (1996) proposed to conserve the name *Sinarundinaria* to accommodate a group of temperate to sub-alpine shrubby bamboos. However, conservation was not approved by the Committee for Spermatophyta. *Yushania*, typified by *Y. nütakayamensis*, is another possible genus for *A. macclureana*. The characters of *Yushania* are summarized as follows: pachymorph rhizomes, 3 to several subequal branches, unarmed nodes, an open semelautant inflorescence with erect spikelets, and flowers with 3 stamens and usually 2 stigmas. For the forthcoming Flora of China bamboo accounts, the three of us agreed to treat it in *Fargesia*, although relationships among the *Thamnocalamus* group need to be critically re-evaluated (Guo & Li, 2004).

Fargesia macclureana (Bor) Stapleton in Bamboo Soc. Newslett. **17**: 17 (1993) —*Arundinaria macclureana* Bor in Kew Bull. [12] **1957**: 420 (1958) —*Borinda macclureana* (Bor) Stapleton in Edinburgh J. Bot. **51**: 290 (1994) —*Sinarundinaria macclureana* (Bor) C. S. Chao & G. Y. Yang in J. Bamboo Res. **13** (1): 20 (1994) —Type: China, Tibet (Xizang), Tripe, Tsangpo Valley, 29° 39' N, 94° 56' E, alt. 2800 m, 8 Jul. 1938, Ludlow, Sherriff & Taylor 7297 (holo-, BM!; iso-, E!).

—*Fargesia setosa* T. P. Yi in J. Bamboo Res. **2** (2): 43 (1983); Keng & Wang, Fl. Reipubl. Popularis Sin. **9** (1): 421 (1996) —*Borinda setosa* (T. P. Yi) Stapleton in Edinburgh J. Bot. **51**: 290 (1994). —Type: China, Tibet (Xizang), Bomi Xian, 29°50'N, 96°18'E, alt. 3000m, forming understory in Picea forest, 1 Aug. 1977, Tong-Pei Yi 77128 (holo-, SIFS!; iso-, SWFC!), **syn. nov.**

Shrubby bamboo; clumps dense. Rhizomes pachymorph, with culm-necks to 5 cm long. Culms unicaespitose, erect, to 6 m tall, to 5 cm in diam.; internodes 23–29 cm long, covered by white wax and when young also by brown bristles; branches 5–7, subequal. Culm-sheaths yellowish green tinged with purple when fresh, slightly longer than the correlated internodes, later deciduous, covered by brown hairs especially on thickened base; ligules ca. 2 mm tall, ciliate; not auricled, with several oral setae when young; blades linear, reflexed, ca. 10 cm long. Leaf-sheaths pubescent; ligules short, densely pubescent; auricles tiny, with deciduous oral setae; petioles densely pubescent abaxially; blades linear-lanceolate, 9–12 × 0.8–1.6 cm, abaxially densely hairy when young, less so when aged, tessellated. Inflorescence semelautant, an open terminal panicle on leafy branchlets, 9–12 cm long. Spikelets 2–3 cm long, tinged with purple, with 2 glumes, 5–7 florets plus a terminal sterile one; lemmas ca. 1.6 cm long, awned, the awns ca. 2 mm long; palea ca. 1.1 cm long; lodicules 3, ciliate, 2 lateral ones larger; stamens 3, anthers yellow; style 1, stigmas 2, feather-like. Caryopses unknown.

This species occurs in SE Tibet (Xizang), in Bomi, Nyingchi, Mainling M dog, and Zay counties, and is the dominant bamboo in the understory of *Picea* or *Pinus densata* and *Quercus* forests at altitudes of 2100–3800 m.

Additional specimens examined. —Tibet (Xizang), Kongbo, Molo, Valley of Lilung Chu, 28° 57' N, 93° 53' E, alt. 3500 m, forming clumps in *Quercus* forest, 23 May 1938, Ludlow, Sherriff & Taylor 4395 (BM, bis; US); Lushu Chu, 29° 20'

N, 94°35' E, alt. 3000–3500 m, in *Picea* forest, 7 Jun. 1938, Ludlow, Sherriff & Taylor 4678 (BM, E); Langpe Gyala, 29°43' N, 94°56' E, alt. 3000 m, 21 Jun. 1938, Ludlow, Sherriff & Taylor 5346 (BM, E); Tsanang La, near Paka, 29°15' N, 94°15' E, alt. 3500 m, 15 Jun. 1938, Ludlow, Sherriff & Taylor 5835 (BM); Bomi Xian, Songzong, alt. 2700–3800 m, 31 Jul. 1977, T. P. Yi 77126 (SIFS); Bomi Xian, Tongmai to Dongjiu (T' ung-chiu), 29°59' N, 94°50' E, alt. 3000 m, 30 Jul. 1990, Y. Fei, H. Sun, De-Zhu Li, & B Bai 323 (KUN); Nyingchi Xian, Dongjiu, alt. 2700 m, 1 Aug. 1977, T. P. Yi 77130 (SIFS); M dog Xian, Gela to Dayandong, alt. 2920 m, 26 Aug. 1977, T. P. Yi 77190 (SIFS); Zay Xian, Shang Zay, alt. 2100 m, 21 Aug. 1979, T. P. Yi 79183 (SIFS); Zay Xian, Chunjie Qiao, alt. 2500–3300 m, 18 Aug. 1979, T. P. Yi 79110 (SIFS).

The type specimen of this species, as designated by the original author, is Ludlow, Sherriff & Taylor 7297. The holotype specimen is also clearly marked. Therefore, Stapleton's (1994) lectotypification is superfluous.

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